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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/091,994 | 03/05/2002 | Josephus C. Ebergen | SUN-P7023-RSH | 6385 |

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| EXAMINER | |
|---|---|
| INOA, MIDYS | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2188 | 2 |

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PRG

| Office Action Summary | Application No. 10/091,994 | Applicant(s) EBERGEN, JOSEPHUS C. | |
|---|---|---|---|
| | Examiner Midys Inoa | Art Unit 2188 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *05 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings filed on May 5th, 2002 have been accepted by the examiner.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 7-9, 14-15, and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakajima (5,269,012).

Regarding Claims 1 and 14, Nakajima discloses a stack memory whose push and pop operations allow it to serve as a LIFO memory. In this stack memory, when a write operation is to occur, the data item to be written is presented to the stack. Once this data item is presented to the stack, this particular item is "Pushed" in to the stack by allowing the last empty cell of the stack ("given cell contains no data items") to get the data item from its previous cells, thus allowing the data item to propagate down the stack. This is clearly demonstrated in Figure 2 where write operations occurs by pushing data item "a" down the stack to cell 4. In this demonstration, empty cells are allowed to get the data item until the data item sits in the last empty cell. Therefore, the data item would first sit in cell 0, then empty cell 1 would request or get the data item, then empty cell 2 would request the data item, empty cell 3 would request the data item, empty cell 4 would request the data item, and since cell 5 is full, no further requests

would be made, thus leaving the data item in cell 4. This concludes the "push" operation of the LIFO stack memory (Figure 2 and Column 2, lines 25-50). This memory also performs a "pop" operation when a read operation is to occur. In a read operation, a data item is requested and the request is presented to the top of the stack. At this point, being that a data item is being requested and this particular stack provides the "last in" data item first, the last full cell ("the given cell contains no space for additional data items") would "put" or transfer its data item to the previous empty cell until such data item has been provided to satisfy the data request. This is clearly demonstrated in Figure 3, where a read operation occurs when given cell 4 "puts" data item "a" in previous empty cell 3. Once this occurs, cell 3 (now full), places data item "a" in previous empty cell 2. Cell 2 performs the same operation as cell 3; placing data item "a" in cell 1. Cell 1 performs the same operation as cell 2; placing data item "a" in cell 0. Finally, cell 0, in performing the same operation as its following cells, renders the data item to the requestor, thus satisfying the read request (Figure 3 and Column 2, line 50 – Column 3, line 3).

Regarding Claim 9, Nakajima discloses a stack memory whose push and pop operations allow it to serve as a LIFO memory. In this stack memory, when a write operation is to occur, the data item to be written is presented to the stack. Once this data item is presented to the stack, this particular item is "Pushed" in to the stack by allowing the last empty cell of the stack ("given cell contains no data items") to get the data item from its previous cells, thus allowing the data item to propagate down the stack. This is clearly demonstrated in Figure 2 where write operations occurs by pushing data item "a" down the stack to cell 4. In this demonstration, empty cells are allowed to get the data item until the data item sits in the last empty cell. Therefore, the data item would first sit in cell 0, then empty cell 1 would request or

get the data item, then empty cell 2 would request the data item, empty cell 3 would request the data item, empty cell 4 would request the data item, and since cell 5 is full, no further requests would be made, thus leaving the data item in cell 4. This concludes the "push" operation of the LIFO stack memory (Figure 2 and Column 2, lines 25-50). This memory also performs a "pop" operation when a read operation is to occur. In a read operation, a data item is requested and the request is presented to the top of the stack. At this point, being that a data item is being requested and this particular stack provides the "last in" data item first, the last full cell ("the given cell contains no space for additional data items") would "put" or transfer its data item to the previous empty cell until such data item has been provided to satisfy the data request. This is clearly demonstrated in Figure 3, where a read operation occurs when given cell 4 "puts" data item "a" in previous empty cell 3. Once this occurs, cell 3 (now full), places data item "a" in previous empty cell 2. Cell 2 performs the same operation as cell 3; placing data item "a" in cell 1. Cell 1 performs the same operation as cell 2; placing data item "a" in cell 0. Finally, cell 0, in performing the same operation as its following cells, renders the data item to the requestor, thus satisfying the read request (Figure 3 and Column 2, line 50 – Column 3, line 3). From the description of the operation if the LIFO stack memory, it can be seen that although the communication and transfer of data between cells is very quick, these transactions do not take place synchronously. Each of them takes place independently of the other. Additionally, Nakajima discloses a state of the stack "SP" which denotes which cells of the stack have data stored in them. Being that the SP value is a known value to the system, it acts as a mechanism of knowing which cells in the array are full and which are empty (Column 3, lines 19-27).

Regarding Claims 2 and 15, from the description of the operation if the LIFO stack memory, it can be seen that although the communication and transfer of data between cells is very quick, these transactions do not take place synchronously. Each of them takes place independently of the other (Column 2, line 25 – Column 3, line 3).

Regarding Claims 7-8 and 20-21, Nakajima discloses a state of the stack "SP" which denotes which cells of the stack have data stored in them. Being that the SP value is a known value to the system, it acts as a mechanism of knowing which cells in the array are full and which are empty (Column 3, lines 19-27).

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3-6, 10-13, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (5,269,012) in view of Chen et al. (US 2003/0120879 A1).

Regarding Claims 3, 10, and 16, Nakajima teaches the invention as disclosed by Claims 1, 9, and 14 above. Nakajima does not teach dividing each cell of the LIFO stack memory into a master and slave location for storing data items. Chen et al. teaches a linked list queue whose structure is divided into blocks or chunks ("cells"), which in turn are divided into two or more data units ("locations", Page 2, Paragraph 0027). Given that within each "chunk" structure within the linked list queue data is removed from the "chunk" queue at the head and entered into the

"chunk" queue at the tail, it can be construed that the last data unit of each chunk acts as a slave unit since it holds new information temporarily until a top data unit has been emptied by a removal operation and thus, the new data is moved up at the event of empty space being available above ("new data item is temporarily stored in the slave location until a preexisting data item in the master location can be moved to... make room for the new data item", Page 2, Paragraph 0029). It would have been obvious to one of ordinary skill in the art at the time the invention was made to equip the LIFO stack memory of Nakajima with the multi-data unit cells of Chen et al. since having the ability to store more than one data item in each cell would allow the system to reference more data with just one pointer, thus making multiple access operations less cumbersome (Figure 2).

Regarding Claims 4-6, 11-13, and 17-19, Nakajima teaches the invention as disclosed by Claims 1, 9, and 14 above. Nakajima does not teach dividing each cell of the LIFO stack memory into a master and slave location for storing data items. Chen et al. teaches a linked list queue whose structure is divided into blocks or chunks ("cells"), which in turn are divided into two or more data units ("locations", Page 2, Paragraph 0027). It would have been obvious to one of ordinary skill in the art at the time the invention was made to equip the LIFO stack memory of Nakajima with the multi-data unit cells of Chen et al. since having the ability to store more than one data item in each cell would allow the system to reference more data with just one pointer, thus making multiple access operations less cumbersome (Figure 2).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Midys Inoa whose telephone number is (703) 305-7850. The examiner can normally be reached on M-F 7:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (703) 306-2903. The fax phone number for the organization where this application or proceeding is assigned is (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Midys Inoa
Examiner
Art Unit 2188

MI

12/10/03

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